DOCUMENT RESUME

ED 332 046 CE 058 097

AUTHOR Harden, Thomas K.
TITLE What Research Should Be Done in Technology Education To Advance the Profession in Areas of Philosophy and Curriculum?
PUB DATE Oct 89
NOTE 20p.; Paper presented at the Mississippi Valley Industrial Teacher Education Conference (76th, Chicago, IL, October 1989).
PUB TYPE Speeches/Conference Papers (150) -- Viewpoints (Opinion/Position Papers, Essays, etc.) (120)

EDRS PRICE MF01/PC01 Plus Postage.
DESCRIPTORS *Curriculum Development; Educational Development; *Educational Philosophy; Educational Research; Industry; Literature Reviews; Needs Assessment; Postsecondary Education; Research Design; Research Methodology; *Research Needs; Secondary Education; *Technology
IDENTIFIERS *Technology Education

ABSTRACT

New and continued research is needed to advance technology education in the areas of philosophy and curriculum. The literature indicates differing philosophical camps as one of the most frequently cited conflicts in technology education. A challenge in the move to technology is the need to define technology education in a consistent, concise manner. Although the Jackson's Mill Industrial Arts Curriculum Theory document is being effectively disseminated, the past practice of discovering industry practices and developing and teaching a curriculum to emulate these practices continues. Research needs include improved research methods, focus on topics of significance to the field, a common direction or set of recognized priorities, and a cumulative research base. The research focus on the practice of teaching rather than on technology and industry may be the source of the primary problem. Topics for future research include resolution of differences of opinion regarding major goals of technology education; bridging of the gap between goals of leaders in technology education and of practitioners; measurement of technological literacy; the value of technology education; provision of adequate teacher inservice; motivation of teachers to implement technology education; effect of the status of the global economy on technology education; cooperation among researchers; and identification of research agendas. (10 references) (YLB)

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WHAT RESEARCH SHOULD BE DONE IN TECHNOLOGY EDUCATION TO ADVANCE THE PROFESSION IN AREAS OF PHILOSOPHY AND CURRICULUM?

Invited Paper Presented at the Seventy-sixth
Mississippi Valley Industrial Teacher Education
Conference, Chicago, Illinois.

Thomas K. Harden, Ed.D.
Professor and Chair
Department of Technology
Northern Kentucky University

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WHAT RESEARCH SHOULD BE DONE IN TECHNOLOGY EDUCATION TO ADVANCE THE PROFESSION IN THE AREAS OF PHILOSOPHY AND CURRICULUM DEVELOPMENT?

In recent years a substantial amount of research has been conducted in technology education. The nature of the research has been varied, both in methodology and in the objects of research. Research reports and other scholarly papers are evident in a wide range of publications, conference proceedings, and clearinghouses. Research in industrial education, and specifically technology education in recent years, has been a major focus of the Mississippi Valley Industrial Education Conference.

The purpose of this paper is to suggest areas of new and continued research which would advance technology education in the areas of philosophy and curriculum development. Technology education is involved with ideas as well as practical activities. Good ideas lead to good practices and good practices lead to good ideas. As educators in technology, we

need what philosophy yields, such as understanding of logical thinking processes and ideas, as well as how these interact with practical activities like curriculum development. Many differences in educational viewpoints have occurred as a result of changes which have taken place within humans and society. As our society has developed it has been necessary to change working ideas or methods. In technology education these changes are marked by several curricular transitions, such as the recent shift from industrial arts to technology education.

One pitfall in dealing with philosophy in education is that too often it is approached with the interest of finding "the solution" to controversial issues, and, when this attempt fails, philosophy is rejected for not providing answers. There are few certainties in education; there are no perfect approaches. Educators are required to think about what they do, to try to reason and to justify actions so that they are meaningful, coherent, and attain the desired educational results.

Practically everything done in education reflects a point of view. A view may not be readily apparent, or specifically addressed in a paper, report, or practice, but it undergirds the educational effort. Pinpointing an educator's philosophy or point of view is sometimes very difficult. The question of purpose is fundamental to consideration of issues in technology education. In this paper, philosophical issues are considered to be ones addressing the purpose of technology education.

For the purpose of this paper curriculum is viewed both as a conceptual scheme and as a changing, living happening it is in the school and community of real people (Saylor and Alexander, 1966). Authors in technology education broadly consider curriculum to be subjects or subject matter, experiences, objectives, plans, and other concepts. No effort has been made in this paper to argue the validity of a particular definition over another. The term "curriculum development" is considered to be the process of creating a curriculum.

The method of inquiry used to address the question of what research should be done centered around the identification and analysis of recent research reports, journal articles, and dissertations. Computer and manual searches of ERIC, RIE, and CITE yielded many documents relating to technology education and philosophy or technology education and curriculum. Using a similar process 44 dissertations dating back to 1976 were identified.

One of the most frequently cited conflicts in technology education involves differing philosophical camps. Clark (1989) states industrial arts/technology education is a true paradigm in crisis, according to Kuhn's (1962) definition. Clark explains that teachers adhere to the beliefs and traditions that are firmly established in successful pedagogical methodologies, which have served them well. He states, however, that tradition may well be what has slowed the progress to a 21st century, technology based paradigm. This new paradigm may be technology education for all students in public schools - a shift, in essence, from one set of beliefs to another.

In McCrory's (1987) review and synthesis of research in technology education it is summarized that "Other studies revealed that philosophical differences run deep and have been closely related to beliefs about what should be the purpose of education." He further stated that:

> It was noted that contemporary leaders in the profession differ in their views of the nature of technology, science, and technological literacy. Studies of the avowed purposes of the field of study concluded that there were differences of opinion among members of the profession regarding what should be the major goals of technology education. It was also evident that there was a significant gap between the goals as seen by leaders in the profession and as seen by practitioners. (p.7)

One of the challenges that comes with the move to technology is a need to define technology education in a consistent, concise manner that will be understood by the total profession in and out of the International Technology Education Association (ITEA), as well as the public it is to serve (Maley, 1987).

The Jackson's Mill Industrial Arts Curriculum Theory document had a far-reaching influence on curriculum revision in the period from 1980-86, and is likely to do so for some time to come (McCrory, 1987). The Jackson's Mill model, with the implementation guide sponsored by the Technical Foundation of America (Wisconsin Department of Public Instruction, 1984), has prompted substantial curriculum change. Numerous studies imply that this new technology education curriculum structure is being effectively disseminated to school administrators and other decision makers (McCrory, 1987).

The changes in the general field of industrial education reflect the world as it is viewed today. The world today is more technological than in the past, and it is likely that to be more so in the future. As the

population increases the limitedness of resources will be more evident, and we will transition to a state of high entropy and greater disorder, with emphasis on the ability to produce, consume, and grow in the industrial era. We have created a wasteful system whose problems increase as we continue to use more resources.

Literature and observation indicate that we in technology education have entered a new and exciting period. Many, however, are still entrenched in the industrial mentality of another era. The usual past practice (since the mission of industrial education has been the study of industry) has been to find out what the practices were in industry for designing or making a product and then to develop and teach curricula to emulate these practices. DeVore (1983) states

> It would be difficult to make the case that such curricula actually provided a true study of industry in the same sense that other disciplines study the behavior of the phenomena of their fields. If the practitioners of industrial

> education had been involved in study and research about industry, then they would have been involved very early in environmental issues, worker health and safety, community and worker control of industries, microprocessor controls in industry, quality control through better design, employee adaptability to technological change, the enhancement of innovation and invention, and productivity questions, among others. But we were not. Our mentality is of an earlier industrial era, an era many do not want to admit no longer exists. (p. 5)

If we are to guide our field to an orderly transition we need to begin by searching for answers to a number of fundamental questions. This will require a

different research agenda than the time-honored traditional one (Devore, 1983).

Research in technology education is done for a variety of reasons - as requirements for doctoral or masters degrees, for promotion and/or tenure, to further develop a field of study, and others. Several problems have been identified with research in the field. McCrory (1987) stresses the need for improved research methods, especially related to research designs. He urges researchers to also focus on topics of significance to the field, and adds that there seems to be no common direction nor set of recognized priorities for investigation. It has also been noted that there seems to be no cumulative research base in the field. Each dissertation stands alone, separate and isolated. There seems to be no agreed-upon research agendas, central themes or important problems. There are no evident on-going identifiable networks of researchers pursuing research on specific topics (DeVore, 1983).

In his synthesis of research in technology education, McCrory (1987) states that he found an

impressive amount of effort expended by members of the profession during a relatively short period of time (1979-86). He also noted that there was a need to redouble our efforts to continue building the knowledge base, lest the profession regress toward mediocrity.

Industrial education according to Lauda (1988) will remain strong so long as the various elements (disciplines) work together cooperatively and capitalize on each other's strengths.

> It is evident that socio-technical conditions have reshaped our society, creating new opportunities for the educational system. Curricular decisions can no longer be made on tradition, an analysis of the status quo, or on future projections utilizing inappropriate data. The membership of the Mississippi Valley Industrial Teacher Education Conference needs to spend time researching and presenting the facts concerning the

> status of the global economy, its use of technical means, and the inevitable social consequences. From such analyses will come appropriate Curricular developments and administrative structures.

Most research in the field relates primarily to education and public schools and is not technology or industry related. Many leaders in technology education support this as appropriate. DeVore (1983) states, however, that this may be the source of the primary problem in the field, the fact that the research focus has been or the practice of teaching rather than on technology and industry. He believes the issue of the practice of teaching is important but not primary. The primary questions in order of importance are:

1. What to teach and why?
2. Who to teach it and why?
3. When to teach it and why?
4. Where to teach it and why?
5. How to teach it and why?

Research questions have not been directed primarily toward the answering "what to teach and to whom?" but to "how to teach it?" For the most part, the first four questions are ignored (DeVore, 1983).

Barnes (1987) addressed the following research questions in a study which stemmed from the vast misunderstanding or broad interpretations as to what technology is and what the study of technology encompasses:

1. Looking into the future, what will be the key descriptions of a definition of technology?
2. Looking into the future, what will be the appropriate curriculum organizers for the study of technology?

These questions have been raised by numerous researchers and studies over the years, and still consensus alludes us.

The decade of the 1980s has clearly been a time of great change, according to Dugger (1983), when the profession has reexamined its underlying foundation and decided to adopt technology as its major curriculum theme. He adds:

> We know, to a certain degree, what we have been doing and we know how well we have been doing it. There is ample evidence from the data that much needs to be done to improve the programs in these curriculum areas. Most certainly, there is a lack of consensus on the overall objectives and purposes of our profession. (p. 108)

More that any other areas, research to resolve the two related issues below would tend to advance technology education in virtually all ways, especially in philosophy and curriculum development.

1. How can we resolve the differences of opinion regarding what should be the majors goals of technology education, and thereby clarify the purpose of technology education?

2. How can we bridge the gap between the goals as seen by leaders in technology education and the goals as seen by the practitioners, and promote the articulation and acceptance of the agreed-upon goals?

Other significant topics for future research are recommended below. These topics are not as broad as the two primary topics previously identified, but were identified in multiple publications as needs to be addressed.

1. Since it is generally agreed that technological literacy is a major goal of technology education, should we work toward more effective measurement of it? How are we evaluating student learning? Should we initiate student outcomes assessment?
2. Is technology education actually accomplishing what we want it to?
3. What is the value of technology education?
4. How can we provide adequate teacher inservice?

5. How can we motivate teachers to implement technology education?
6. Are we neglecting how to teach? Should teaching methodology receive more attention?
7. How does the status of the global economy affect technology education?
8. How can researchers work cooperatively and capitalize on each others strengths?
9. Is it desirable to identify research agendas or central themes? If so, how could it be done?

The question addressed in this paper is "What research should be done in technology education to advance the field in the areas of philosophy and curriculum?" In attempting to answer this question it became very clear that issues of curriculum development are inextricably tied to issues of philosophy. Philosophical issues have tremendous impact on curriculum development. Several recommendations are contained in this paper which were developed during an extensive, albeit informal, review of the literature related to research needs in technology education.

REFERENCES

Barnes, J. L. (1987). An international study of curricular organizers for the study of technology. Technological literacy: The roles of practical arts and vocational education. Columbus: The Ohio State University.

Clark, S. C. (1989). The industrial arts paradigm: Adjustment, replacement, or extinction? Journal of technology education, 1(1), 7-21.

DeVore, P. W. (1983). Research and industrial education searching for direction. (Report No. CE 038 616). Paper presented at the American Vocational Association. (ERIC Document Reproduction Service No. ED242 875)

Dugger, W. E. Jr. (1988). Evaluation of our profession over the past twenty-five years: Quantitative and qualitative benchmarks. In D. L. Householder (Ed.), Industrial teacher education in transition. Mississippi Valley Industrial Teacher Education Conference.

Kuhn, T. (1962). The structure of scientific revolutions. Chicago: University of Chicago Press.

Lauda, D. P. (1988). Industrial teacher education 1988-2000. In D. L. Householder (Ed.), Industrial teacher education in transition. Mississippi Valley Teacher Education Conference.

Maley, D. (1987). Technology education challenges and opportunities. The technology teacher, 46(7).

McCrory, D. L. (1987). Technology education: industrial arts in transition a review and synthesis of the research, fourth edition. (Report No. CE 049 638) Columbus, OH: The Ohio State University, National Center for Research in Vocational Education. (ERIC Document Reproduction Service No. ED 290 935)

Saylor, J. G. & Alexander, W. M. (1966). Planning curriculum for schools. New York: Holt, Rinehart and Winston.

Wisconsin Department of Public Instruction (1984). Industry and technology education: A guide for developing contemporary industrial arts/technology

education curricula. (ERIC Document Reproduction Service No. ED 248 340)